Growing Corticosteroid Consumption in the Developing World as a Factor in the Epidemiology of Emerging/Reemerging Infectious Diseases

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Topic Summary
Current research on medicine use in many parts of the developing world reveals a scale of use of corticosteroids far higher than in previous decades. Prolonged or high-dose corticosteroid use is associated with suppressed immune function. The project summarized here uses the case of Indonesia to explore actual usage patterns of steroid-containing products and the various factors underlying their increased use.

Scale of Use of Steroids and the Commodification of Medicines
The commoditization of medicines has contributed to an extensive black/grey market in medicines, particularly compounds that have an immediate, beneficial effect such as steroids, NSAIDs, analgesics, etc.
Corticosteroids occur as both overt and covert ingredients in a vast array of readily available products, including those marketed as traditional medicines.

Examples of Corticosteroid Containing Medicines

- **Pharmaceuticals**: e.g., betamethasone, dexamethasone, prednisone, hydrocortisone.
  - **Sources**: Obtained through medical practitioners, clinics, pharmacies, non-licensed compounding pharmacists, medicine shops, markets, etc.
  - **Forms**: tablet, syrup, inhaled, ampoules, topical preparations.
  - **Over the counter (OTC) products**: e.g., skin ointments, skin-lightening creams, hair tonics.
  - **Traditional medicines**: locally made or imported (e.g., from China, Taiwan).
  - **Forms**: Powder (to be mixed with water or other liquid, e.g., honey), tablet, capsule, bottled beverage, etc.

[Note: Most of the major Indonesian jamu brands are not implicated in contamination issues.]

The Desirability of Steroid-Containing Medicines: Medicating the Effects of Poverty

**Value of corticosteroids**: Corticosteroids are powerful therapeutic agents used in a wide range of disorders such as rheumatological diseases, gout, allergies, skin conditions, etc.
**Desired effects**/side-effects: anti-inflammatory, enhanced sense of well-being and energy, increased appetite, weight gain.
**Context of high use-ratios**: Desire for quick relief from the effects of harsh living and working conditions. Declining economic circumstances that reduce people's purchasing power for medical care/ pharmaceuticals.

Medicines as Objects of Petty Trade: The Business of Medicines
The importance of medicines as objects of exchange is growing. Medicines are a divisible commodity traded through both formal and informal economic structures.

New localized trading networks arise and these then interlock with wider capital networks.
The medicine trade provides multiple levels of opportunity for economic gain.

Dangers of Prolonged and/or High Dose Corticosteroid Use
Steroids decrease inflammation and reduce the activity of the immune system.
Prolonged use causes adrenal atrophy leading to an impaired adrenocortical response to illness. Even at anti-inflammatory doses, drugs such as hydrocortisone, prednisone and dexamethasone cause a reduction of circulating lymphocyte populations and thus immune suppression.
The resulting immune-suppression facilitates human susceptibility to disease organisms, as well as the likelihood of experiencing illness in a more severe form. Further, because steroids mask or alter clinical presentation, infections may become more advanced before help is sought, increasing the likelihood of further spread to others.
Such people constitute potential hosts for the further evolution of disease causing organisms, e.g., through the reassortment or recombination of genetic material. Immune impairment is compounded by poor nutrition and poor living conditions associated with poverty.

**Visible effects of extended use**: The signs of Cushingsoid syndrome are easily observed: e.g., moon face, striae, thinning of the skin, easy bruising, acne, fat deposits on trunk, muscle wasting. Also common are mood swings, and nervousness or restlessness.

**Recommendations re. WHO research guidelines**: WHO guidelines for research on the epidemiology of infectious diseases (including emerging diseases such as Influenza A[H5N1]) should include the gathering of first-hand information regarding expanding patterns of use of corticosteroids and other steroidal substances affecting immune response.